

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A state estimation system for determining possible values of a measured data item comprising:
 - a computer;
 - at least one measurement input to the computer measuring the data item, said measurement corrupted by noise;
 - a computer output device;
 - at least one restriction on the measured data item, said restriction available in memory to the computer; and
 - a software module operating on the computer for calculating at least one estimate of the state of the measured data item based upon the measurement input and the restriction, and sending the estimate to the output device;wherein the software module calculates the estimate by:
 - representing the state space of the measured data item as a finite set of points using the restriction;~~and~~
 - computing a first decision rule based upon the finite set of points;
 - computing a second decision rule by extending the first rule to include additional points within the state space of the measured data item;
 - and

applying ~~a~~ the second decision rule, ~~said decision rule based on the finite set of points,~~ to the measurement input.

2. (previously presented) The system of claim 1 wherein the decision rule is minimax, Bayes or Gamma-minimax.
3. (previously presented) The system of claim 1 wherein prior statistical information about the measured data item is available in memory to the computer, and the decision rule uses the statistical information.
4. (previously presented) The system of claim 1 wherein the measured data item is comprised of a plurality of values.
5. (previously presented) The system of claim 1 wherein the decision rule is based upon a loss function.
6. (previously presented) The system of claim 5 wherein the loss function is zero-one or squared-error.
7. (previously presented) The system of claim 1 wherein the estimate forms a confidence set.
8. (previously presented) The system of claim 1 wherein the output device is a second software module.
9. (currently amended) A system for making decisions related to a task comprising:
 - a computer;
 - ~~at least one confidence set available to the computer in memory, said confidence set describing the value of a first state variable;~~
 - a task definition available to the computer in memory;
 - a description of possible decisions available to the computer in memory;

a description of effects of the possible decisions on a second state variable, the description of effects available to the computer in memory, said effects dependent on the value of the first state variable;

a computer output device;

a software module operating on the computer for making decisions based on ~~the confidence set~~, the task definition, the possible decisions and the description of effects, and sending the decision to the output device;

wherein the software module selects at least one decision from the possible decisions by:

computing a restriction on the value of the first state variable;

computing a confidence set describing the value of the first state variable,

while performing the computation based on the restriction;

performing calculations on the effects of possible decisions on the second state variable, while restricting the calculations based upon the confidence set; and

evaluating values resulting from the calculations for compatibility with the task definition.

10. (currently amended) The system of claim 9 wherein the confidence set is ~~provided by~~ computed using a state estimation system.
11. (previously presented) The system of claim 9 wherein the first state variable and the second state variable are each a vector comprised of at least one variable.
12. (previously presented) The system of claim 11 wherein some or all of the variables in the first vector are the same as some or all of the variables in the second vector.

13. (currently amended) The system of claim 9 wherein there is ~~a plurality of confidence sets~~
~~from different sources~~ additional stochastic information available about the value of the
first state variable, and said stochastic information and the information contained in ~~said~~
~~the confidence sets~~ set is fused.
14. (previously presented) The system of claim 9 wherein the output device is a second
software module.
15. (currently amended) A state estimation method for determining possible values of a
measured data item using a computer to perform the following steps:
- reading at least one measurement corrupted by noise;
 - determining at least one restriction on the measured data item;
 - calculating at least one estimate of the state of the measured data item based upon
the measurement and the restriction by:
 - representing the state space of the measured data item as a finite set of
points using the restriction; ~~and~~
 - computing a first decision rule based upon the finite set of points;
 - computing a second decision rule by extending the first rule to include
additional points within the state space of the measured data item;
 - and
 - applying ~~a~~ the second decision rule, ~~said decision rule based on the finite~~
~~set of points,~~ to the measurement input; and
 - sending the estimate to an output device.
16. (previously presented) The method of claim 15 wherein the decision rule is minimax,
Bayes or Gamma-minimax.

17. (previously presented) The method of claim 15 wherein prior statistical information about the measured data item is available in memory to the computer, and the decision rule uses the statistical information.
18. (previously presented) The method of claim 15 wherein the measured data item is comprised of a plurality of values.
19. (previously presented) The method of claim 15 wherein the decision rule is based upon a loss function.
20. (previously presented) The method of claim 19 wherein the loss function is zero-one or squared-error.
21. (previously presented) The method of claim 15 wherein the estimate forms a confidence set.
22. (previously presented) The method of claim 15 wherein the output device is a software module.
23. (currently amended) A method for making decisions related to a task using a computer to perform the following steps:
 - ~~reading at least one confidence set, said confidence set describing the value of a first state variable;~~
 - reading a task definition;
 - reading a description of possible decisions;
 - reading a description of effects of the possible decisions on a second state variable, said effects dependent on the value of the first state variable;
 - selecting at least one decision based on ~~the confidence set,~~ the task definition, the possible decisions and the description of effects by:

computing a restriction on the value of the first state variable;

computing a confidence set describing the value of the first state variable,

while performing the computation based on the restriction;

performing calculations on the effect of possible decisions on the second

state variable, while restricting the calculations based upon the

confidence set; and

evaluating values resulting from the calculations for compatibility with the

task definition; and

sending the selected decision to an output device.

24. (currently amended) The method of claim 23 wherein the confidence set is ~~determined by~~

computed using a state estimation method.

25. (previously presented) The method of claim 23 wherein the first state variable and the

second state variable are each a vector comprised of at least one variable.

26. (previously presented) The method of claim 25 wherein some or all of the variables in the

first vector are the same as some or all of the variables in the second vector.

27. (currently amended) The method of claim 23 wherein there is ~~a plurality of confidence~~

~~sets from different sources~~ additional stochastic information available about the value of

the first state variable, and said stochastic information and the information contained in

~~said the confidence sets-set~~ is fused.

28. (previously presented) The method of claim 23 wherein the output device is a software

module.